JOURNAL OF APPLIED BEHAVIOR ANALYSIS 1991, 24, 523–535 NUMBER 3 (FALL 1991)

THE EFFECTS OF SEVERE BEHAVIOR PROBLEMS IN CHILDREN ON THE TEACHING BEHAVIOR OF ADULTS

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Applied behavior analysts have focused on how adults can influence the problem behavior of children using a variety of behavior modification strategies. A related question, virtually unexplored, is how the behavior problems of children influence adults. This child-effects concept was explored empirically in a study involving 12 adults who were asked to teach four pairs of children in which one member of the pair exhibited problem behavior and the other typically did not. Results demonstrated that problem children displayed tantrums, aggression, and self-injury contingent on adult instructional attempts but not at other times, whereas nonproblem children showed little or no problem behavior at any time. Importantly, from a child-effects perspective, adults engaged in teaching activities with nonproblem children more often than with problem children. Also, when an adult worked with a problem child, the breadth of instruction was more limited and typically involved those tasks associated with lower rates of behavior problems. The implications of these results are discussed with respect to theories of escape behavior, current assessment practices, and intervention issues related to maintenance. The existence of child effects suggests that problem behavior may be better understood when it is conceptualized as involving a process of reciprocal influence between adult and child.

DESCRIPTORS: functional analysis, problem behavior, developmental disabilities, classroom behavior, child effects

Much of the field of child behavior modification is concerned with instructing parents, teachers, and other adults in the use of procedures to change children's behavior in socially desirably directions (Sulzer-Azaroff & Mayer, 1977). This practice has given rise to the perception that children play a rather passive role in the intervention process, one in which they are viewed as the recipients of treatment rather than as active participants (Emery, Binkoff, Houts, & Carr, 1983). Yet, for some time, a number of applied behavior analysts have argued, at a conceptual level, that the child should be viewed as actively influencing the behavior of others (Bijou & Baer, 1978; Hawkins, 1986; Kanfer & Saslow, 1969). This theme is echoed in the field of developmental psychology, where there has been considerable interest in understanding how children can change adult behavior. This concept has been called *child effects* (Bell & Harper, 1977; Hetherington & Parke, 1986). Indeed, there have been a number of empirical demonstrations showing that certain aspects of normal child behavior, such as vocalization (Gewirtz & Boyd, 1977), crying (Murray, 1979), smiling (Bates, 1976), activity level (Stevens-Long, 1973), aggression (Fagot, 1984), and speech (Bohannon & Marquis, 1977) systematically influence adult behavior.

The discussion and demonstration of child effects has not gone unnoticed by some behaviorally oriented clinicians and researchers. Particularly in the area of conduct disorders, there has been a tradition of examining the impact that aggression and oppositional behavior have on adult responding (Patterson, 1982; Wahler & Dumas, 1986). Also, in

This investigation was supported in part by Cooperative Agreement G0087C0234 from the U.S. Department of Education, "A Rehabilitation Research and Training Center on Community-Referenced Technologies for Nonaversive Behavior Management" to the first author, and a Sigma Xi grant-in-aid of research to the third author. Portions of this paper were presented at the annual meeting of the Association for Behavior Analysis, Philadelphia, May 1987.

We thank Martin Hamburg, Executive Director, Suffolk Child Development Center, for his generous support and Denise Berotti, Mary Ekdahl, and Patti Montgomery for help with data collection and analysis. Finally, we thank Rob Horner for his helpful criticisms.

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the field of developmental disabilities, there is some indication that children with serious behavior deficits affect overall family functioning (Schopler & Mesibov, 1984). Further, more circumscribed aspects of a child's behavior, involving language and communication skills, may likewise influence parental responding (Hodapp, Evans, & Ward, 1989; Konstantareas, Zajdeman, Homatidis, & McCabe, 1988). Surprisingly, in light of the intense interest that clinicians and researchers have had in the treatment of behavior problems, there are virtually no reports in the literature that document the impact of serious misbehavior on adults, although there is some suggestion that the degree to which an adult interacts with a child is affected by problem behavior (Durand & Kishi, 1987).

There are important reasons for empirically analyzing the effects of severe behavior problems on adults. Specifically, in recent years, there has been a growing emphasis on basing treatment selection on an analysis of the variables of which behavior problems are a function (Carr, 1988; Carr, Robinson, & Palumbo, 1990; Iwata, Dorsey, Slifer, Bauman, & Richman, 1982; Repp, Felce, & Barton, 1988). For example, functional analysis has revealed that socially oriented behavior problems appear to fall into two broad classes (Carr & Durand, 1985b): those maintained by positive reinforcement (e.g., attention, tangibles) and those maintained by negative reinforcement (e.g., escape from aversive stimuli such as task demands). Significantly, the literature in developmental disabilities suggests that treatments selected on the basis of a thorough functional analysis tend to produce better outcomes than those not based on such an analysis (Carr, Robinson, Taylor, & Carlson, 1990). The delineation of the reciprocal effects that child and adult behavior have on one another can be viewed as extending the functional analysis of problem behavior, thereby potentially contributing to treatment planning.

Implicit in the functional analysis of behavior problems is the notion that child effects play a role in the maintenance of misbehavior. Consider, as an example, misbehavior maintained by negative reinforcement (escape). This type of behavior problem is especially noteworthy because it frequently occurs as a response to difficult or frustrating task demands such as those commonly seen in vocational, home, and school situations. It has been assumed that escape behavior is maintained through a process of negative reinforcement in which the adult withdraws task demands in response to severe misbehavior (Carr & Durand, 1985b; Iwata, 1987). Based on this assumption, one would predict that an adult should be less likely to present demands to children who exhibit problem behavior maintained by negative reinforcement. Also, an adult would be expected to avoid tasks that generate high rates of behavior problems. However, an analysis of the effects of child behavior (maintained by negative reinforcement) on the escape or avoidance behavior of adults has not been conducted. The major purpose of the present study was to evaluate the predictions just noted as well as their implications for assessment and intervention.

METHOD

Participants

Subjects. Twelve female undergraduates, 18 to 22 years of age, served as subjects. All were pursuing careers in special education or human services. Subjects were recruited through class announcements. The first 12 individuals whose schedules overlapped with child research availability were selected for the study. Subjects were given practicum course credit for their participation. They were told that they would be teaching a pair of preschoolers with developmental disabilities and that sessions would be videotaped so adult–child interactions could be observed.

Children. Eight preschool children participated. Four of the children were cooperative, typically displaying few if any behavior problems in work situations (nonproblem children). Four of the children typically displayed severe behavior problems in work situations (problem children).

The first 8 children (4 nonproblem and 4 problem) who met all of the following criteria were selected: (a) nomination by the classroom teacher, (b) a pattern of either behavior problems or no

Table 1
Chronological Age, Mental Age, Diagnosis, and Behavior Problems of Children

Child pair	Chronological age (months)	Mental age (months)	Diagnosis	Behavior problems
Sam (NP)	42	46	language delayed	whining
Mary (P)	39	42	speech impaired, emotionally disturbed	crying, screaming, tantrums
Jim (NP)	31	20	speech delayed	none
Joe (P)	42	30	atypical pervasive developmental disorder	biting, hitting, tantrums, throwing objects
Keith (NP)	47	38	speech and motor delay, heart disease, hypothyroidism	whining
May (P)	47	49	autistic characteristics	screaming, crying, kicking, tantrums
Al (NP)	29	29	speech delayed	whining
Stuart (P)	31	21	autistic characteristics	crying, screaming, biting, tantrums, head-banging
Mean (NP)	37.25	33.25		
Mean (P)	39.75	35.50		

Note. Children are listed in the table in the pairs in which they were instructed. NP = nonproblem child; P = problem child. Mental age for Jim and Stuart was assessed using the Bayley Scales of Infant Development; all other children were assessed using the Merrill Palmer Scale of Mental Tests.

behavior problems observed by the authors during 1 to 2 hr of direct classroom observation, and (c) a pattern of either behavior problems or no behavior problems observed when the authors themselves worked individually with a child for 30 min on a variety of classroom tasks. The 8 children thus selected were randomly grouped into four pairs such that each pair included a problem child and a nonproblem child. Characteristics of the child pairs are given in Table 1. The problem and nonproblem children were not significantly different from one another with respect to either chronological age, $t(6) = 0.46$, ns, or mental age, $t(6) = 0.27$, ns.

Setting

All sessions were conducted in a classroom (5 m by 10 m) in the children's school. The room was equipped with a low work table, chairs for the children and the adult, and a shelf of toys. A videocamera on a tripod was set up at one end of the room so that sessions could be taped for later coding. One or two observers were present at all times to monitor the video equipment and assist in setting up the classroom.

Procedure

Adult training. All adult subjects were first trained in the discrete-trial teaching method (Koegel, Russo, & Rincover, 1977). This method involves the presentation of tasks in separate learning trials. The adult presented a demand to the child. If the child failed to respond or responded incorrectly, the correct response was prompted and the task demand was repeated. The procedure was repeated until the child responded correctly. Verbal praise was provided contingent upon correct responses.

Training the adult subjects was spread over a 3-week period and began with a 2-hr workshop in which the discrete-trial method and its rationale were presented. All subjects were given an instructional manual covering this material. Several methods for managing behavior problems were presented during the workshop and in the manual. These included working through inappropriate behavior, ignoring inappropriate behavior, praising another child for appropriate behavior, switching tasks, or taking a break after first getting compliance with a simple request.

Subjects then conducted five sessions in which they practiced teaching children other than those involved in the study and received corrective feedback on their skills. Before participating in the study, each subject was required to administer 10 trials to a child and was scored on each trial for the correctness or incorrectness of their performance according to the criteria described by Koegel et al. (1977). Subjects were required to pass this performance test with a score of at least 90% accuracy. All potential subjects passed the performance test.

Task selection. The children were initially assessed on a variety of common preschool tasks selected in consultation with the children's teachers. Typical tasks included naming colors, labeling pictures, identifying body parts ("Point to your nose, ears, eyes, etc."), and sorting objects. Eight tasks were selected for each child. Four easy tasks (i.e., tasks generating more than 80% correct responding) and four difficult tasks (i.e., tasks generating less than 50% correct responding) were selected. In addition, half of the easy and half of the difficult tasks involved repeated adult–child exchanges (e.g., the adult asked, "What color is this?" and the child answered correctly, "green"; then the adult asked, "What color is this?" and the child answered correctly, "red," and so on). In contrast, the remaining half of the tasks were more independent in nature (i.e., they could be completed by the child without ongoing adult supervision). Because subsequent data analyses did not show that specific types of tasks were consistently associated with specific patterns of behavior, all future discussion of task influences refers to the pooled aggregate of tasks rather than any one type of task. Adult subjects were shown how to present the specific tasks to the children and were allowed to practice with the instructional materials for a 15-min session before working with the children formally.

Formal sessions. Sessions were 22 min long. Each adult subject taught five sessions, and subjects taught the same pair of children for all five sessions spread over a 2- to 3-week period. Each pair of children was taught, in this manner, by the 3 adults sequentially. Teaching sessions involved triads consisting of a nonproblem child, a problem child, and an adult subject. We used triads because small-group instruction in the preschool frequently consisted of the triadic format, particularly when a child with severe behavior problems was involved. One to three sessions were conducted on a single day with a minimum 10-min break between sessions. Before the beginning of the first session, the experimenter introduced the pair of children and the adult to each other. The adult was instructed to begin each session by telling the children, "It's time to work."

During the session, the adult subject was allowed to choose which tasks she presented to each child, how many tasks she presented, how she distributed her time between the 2 children, and when the children were allowed to take breaks. However, the subjects were not given any feedback about their performance either during or between sessions. If a subject requested feedback, she was referred to the training manual.

Design

The formal sessions conformed to a simultaneous treatments design. Within each triad, exposure to the problem child constituted one of the treatments and exposure to the nonproblem child was the other treatment.

Response Recording and Reliability

Videotapes were coded for the sequence of adult and child behaviors. Behaviors were recorded continuously in the order in which they occurred using 10-s intervals. For purposes of analysis, adult behaviors were defined as either instructional or noninstructional. Instructional behavior included the following categories: (a) approaches to the child that signaled a teaching episode (e.g., "Jimmy, it's time to work now"), (b) task commands (e.g., "Point to the cup"), (c) disciplinary commands (e.g., "Sit up straight in your seat"), (d) cajolery (e.g., "Wouldn't you like to sort all the pretty colors?" spoken in a sing-song tone of voice), (e) approval (e.g., "That's right. It's a picture of a dog"), and (f) disapproval (e.g., "No, that's wrong"). Noninstructional behavior with respect to a given child included two categories: (a) providing instruction to the other child, and (b) gathering together materials in preparation for teaching,

thereby instructing neither child. Child behavior problems were also recorded and included the following behaviors: (a) tantrums defined as instances of yelling, crying, whining, or screaming that occurred in various combinations; (b) running away from the adult or attempting to leave the room; (c) physical aggression defined as hitting, kicking, spitting, biting, scratching, pinching, hair pulling, or throwing objects; (d) verbal aggression defined as threats (e.g., "I'll hit you") or profanity (e.g., "Drop dead"); (e) self-injurious behavior defined as head banging, self-biting, or self-slapping.

Reliability checks were taken by a second independent observer on 44.2% of the sessions spread across all 12 subjects. An agreement was scored only when the two observers scored the same behavior categories in the same sequence in the same time interval. The index of reliability was the number of agreements divided by the number of agreements plus disagreements. The median interobserver reliability was 99% for the exhaustive category instructional/noninstructional (range, 75% to 100%) and 99% for child behavior problems (range, 68% to 100%).

Sessions were also coded separately for a specific subcategory of instructional behavior, namely, whether a task command was presented and, if so, how many teaching trials were carried out involving the task command. Task commands were recorded continuously, and any child behavior problems occurring within 5 s following presentation of a task were also recorded, with the additional proviso that no other behavior category (e.g., disciplinary statements, cajolery, etc.) occurred between presentation of the task and onset of the behavior problem. Reliability was taken by a second observer on 93% of the sessions. The same index of reliability described previously was used. The median interobserver reliability across categories was 92% (range, 61% to 100%).

RESULTS

A descriptive summary of the results is provided in Table 2. The two left columns in Table 2 show the percentage of intervals in which adult instructional behavior was followed by behavior problems in problem versus nonproblem children. All data in the table are pooled across the five 22-min observational sessions. Consider the data for Adult 1. When this adult taught the nonproblem child in the pair, instructional behavior was followed by behavior problems in only 2.4% of the intervals. In contrast, when the adult taught the problem child, instructional behavior was followed by behavior problems in 46.8% of the session intervals. This pattern was replicated across all 12 adults. Specifically, the median level of behavior problems was 57.5% (range, 40% to 72.6%) for the problem children but 3.3% (range, 0% to 32.5%) for the nonproblem children. Anecdotal observation suggested that the severity of behavior problems differed markedly between the two groups in that problem children typically displayed high-intensity misbehavior during the sessions, whereas nonproblem children typically displayed low-intensity misbehavior.

The two middle columns in Table 2 show the percentage of intervals in which adult noninstruc-

Table 2

Percentage of Intervals of Instructional Behavior Versus Noninstructional Behavior That Were Followed by Behavior Problems, and Number of Intervals of Instructional Behavior Provided

	% Intervals followed by behavior problems				Number of intervals of instructional behavior	
	For instructional behavior		For noninstructional behavior			
	P	NP	P	NP	P	NP
Adult 1	46.8	2.4	5.9	0.5	218	376
Adult 2	58.3	13.9	6.6	1.1	199	417
Adult 3	51.5	15.0	3.3	1.8	171	479
Adult 4	56.7	2.1	8.8	0.8	289	339
Adult 5	52.0	0.7	8.1	0	323	295
Adult 6	51.0	4.1	18.4	0	155	412
Adult 7	60.7	6.4	7.7	0	321	342
Adult 8	65.2	17.2	0.2	22.7	69	506
Adult 9	60.1	32.5	8.4	2.1	233	400
Adult 10	40.0	1.9	6.1	0	115	377
Adult 11	60.3	0	25.4	0	315	341
Adult 12	72.6	0.9	24.0	0	277	349
Median	57.5	3.3	7.9	0.3	226	377

Note. P = problem children; NP = nonproblem children.

tional behavior was followed by behavior problems. These data were analyzed separately from the instructional behavior data to evaluate the selectivity with which problem behavior was displayed. For example, when Adult 1 was engaged in noninstructional behavior, the problem child displayed behavior problems in only 5.9% of the intervals; this contrasts sharply with the data for the instructional situation, in which problems occurred in 46.8% of the intervals. On the other hand, when the adult was engaged in noninstructional behavior with the nonproblem child, behavior problems occurred in only 0.5% of the intervals, a figure comparable to the data obtained for the instructional situation in which, as noted previously, problems occurred in 2.4% of the intervals. A lower level of behavior problems during noninstructional situations was observed for 11 of 12 adults, with the median level of behavior problems in the noninstructional situation being 7.9% (range, 0.2% to 25.4%) for problem children and 0.3% (range, 0% to 22.7%) for nonproblem children. Thus, the subgroup of problem children exhibited behavior problems selectively, that is, more often in instructional situations (median level, 57.5%) than in noninstructional situations (median level, 7.9%). In contrast, the subgroup of nonproblem children typically exhibited few behavior problems in both situations.

The third set of data in Table 2, presented in the two right columns, shows the reactions of adults to the two subgroups (i.e., child effects). The data show the number of intervals of instructional behavior provided by the adult to the problem versus nonproblem child. Adult 1, for example, provided 376 intervals of instruction to the nonproblem child but only 218 intervals of instruction to the problem child. This pattern was replicated for 11 of the 12 adults, with the median number of intervals of instructional behavior being 377 (range, 295 to 506) for nonproblem children and 226 (range, 69 to 323) for problem children, $F(1, 8) = 14.4$, $p < .005$. There was no significant main effect of child pair on adult behavior, $F(3, 8) = 0.23$, $p = .87$, and no significant interaction between child pair and type of child, $F(3, 8) = 0.59$, $p = .64$. Thus, these data demonstrate that adults typically provided less instruction to those children who responded to instruction with problem behavior and more to those children who typically did not misbehave in response to instruction.

Figure 1 presents data on one subcategory of instructional behavior, task commands, because past research has focused specifically on this aspect of instructional behavior. Consider the data for Adult 1. When this adult presented task commands to the nonproblem child, the child never misbehaved following a command. In contrast, the problem child misbehaved following 12.2% of the commands presented. Similar data were obtained for 11 of the 12 adult subjects. Specifically, the median level of behavior problems following task commands was 15.5% (range, 5% to 57.7%) for the problem children but only 0.6% (range, 0% to 7.1%) for the nonproblem children. One of the subjects, Adult 10, never presented a task command to the problem child because, for this adult, any approach behavior made toward the child (e.g., saying "Let's go to the work table now") immediately evoked severe behavior problems and thereby terminated further instructional efforts. Therefore, a comparison between the problem and nonproblem children with respect to task commands was not applicable to this case. In sum, these data demonstrate that the problem children misbehaved more often following the presentation of a task command than did the nonproblem children, who rarely misbehaved in this situation.

The data just described pertain to the behavior of the child toward the adult presenting the task commands. A related issue concerns the behavior of the adult toward the child (i.e., child effects). Did the adults respond differentially to the two subgroups of children? Figure 1 also displays data on the percentage of total task commands presented to the nonproblem versus problem child. Consider the data for Adult 1. This adult presented 57.2% of her commands to the nonproblem child but only 42.8% to the problem child, a pattern that was replicated across all 12 adult subjects. The median number of task commands presented was 147 (range, 88 to 205) for the nonproblem children but only 61.7 (range, 0 to 115) for the problem

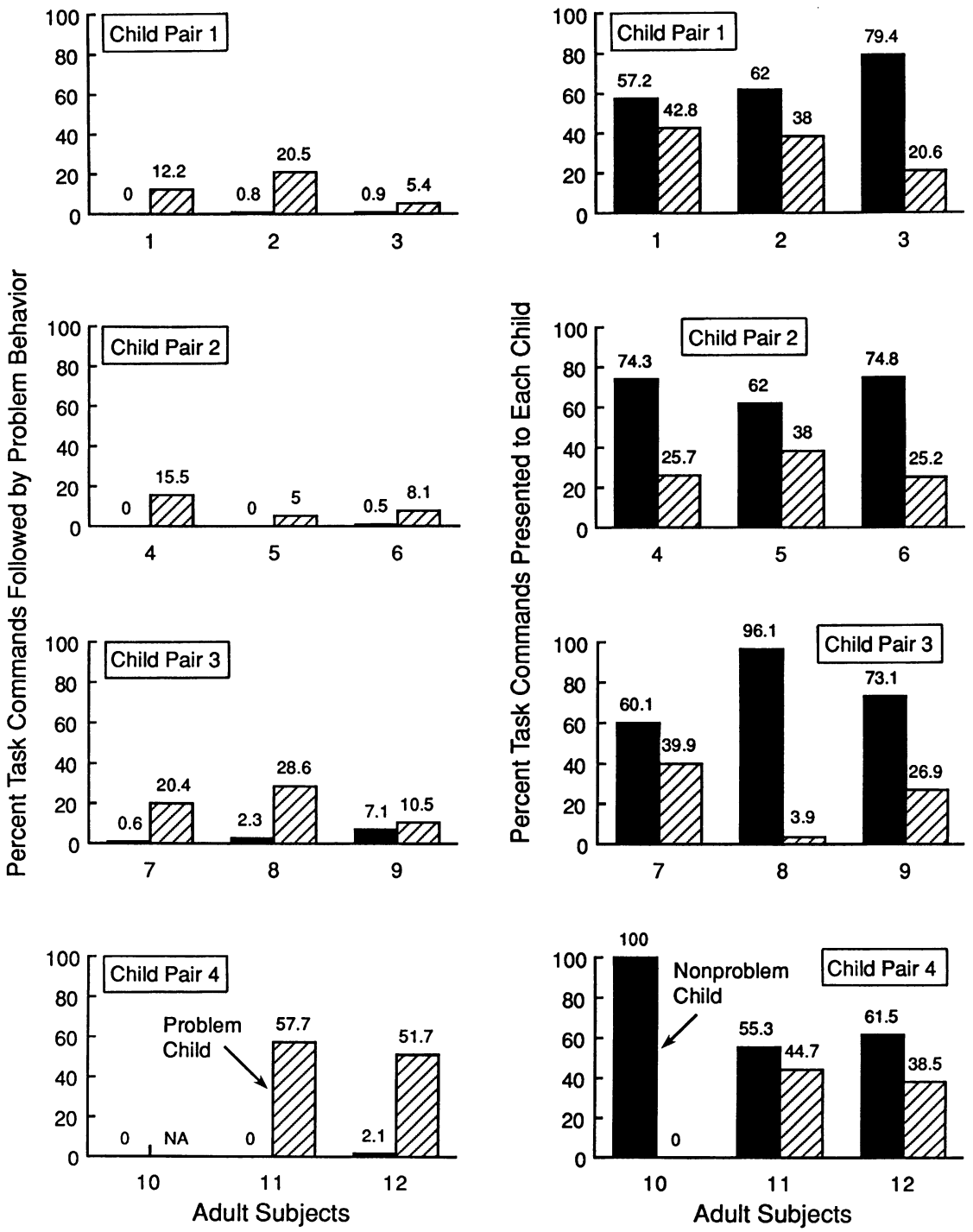

Figure 1. Percentage of task commands followed by problem behavior for each member of the child pair across adults (left column) and percentage of task commands presented to each child by the adult across each child pair (right column). Diagonal line histograms represent data for the problem children, and solid histograms show data for the nonproblem children.

Table 3
Relationship Between Percentage of Problem Behavior Following Tolerated versus Untolerated Tasks and the Number and Percentage of Untolerated Tasks Presented to Problem Children

	Tolerated tasks	Untolerated tasks	Median % behavior problems for tolerated tasks	Median % behavior problems for untolerated tasks	Total trials (untolerated + tolerated tasks)	Trials of untolerated tasks	% Untolerated tasks presented (actual)	% Untolerated tasks presented (expected)
Adult 1	3	3	0	67	89	15	16.9	50
Adult 2	3	3	0	100	52	10	19.2	50
Adult 3	2	2	0	75	34	4	11.8	50
Adult 4	3	4	0	100	53	13	24.5	57.1
Adult 5	3	1	4	50	42	2	4.8	25
Adult 6	3	2	0	36.5	35	11	31.4	40
Adult 7	3	5	4	62	89	27	30.3	62.5
Adult 8	3	1	0	100	5	2	40	25
Adult 9	3	2	0	83.5	45	4	8.9	40
Adult 10	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Adult 11	0	8	N.A.	64	66	66	100	100
Adult 12	1	4	20	45	60	55	91.7	80

Note. Not applicable (N.A.) because no tasks were presented (Adult 10) or no tolerated tasks were presented (Adult 11).

children. Adult subjects presented significantly more task commands to nonproblem children than to problem children, $F(1, 8) = 26.6, p < .001$. There was no significant effect of child pair on adult behavior, $F(3, 8) = 3.46$, $P = .07$, and no significant interaction of child pair and type of child, $F(3, 8) = 0.46$, $p = .72$.

Given the inverse relationship between level of problem behaviors and number of instructions and task commands presented, one can raise the related question of whether level of behavior problems also influenced the *content* of what was taught. That is, because the adults periodically attempted to present task commands to the problem children (albeit at a low level), what task commands did they choose to present? Table 3 addresses this issue by dividing tasks into two types: those tasks followed by behavior problems on 25% or more of the trials in which they were presented (untolerated tasks) versus those tasks followed by behavior problems on fewer than 25% of the trials in which they were presented (tolerated tasks). The 25% cutoff was chosen on the assumption that problem behavior would typically occur at a very low level for some tasks (i.e., on many fewer than 25% of the trials) and at a considerably higher level for other tasks (i.e., on many more than 25% of the trials). Adult 1 presented three tolerated tasks and three untolerated tasks; that is, of the eight tasks available, she presented only six. In fact, of the 11 adults who presented tasks to the problem children (Adult 10 presented no tasks), only 2 presented all eight of the available tasks. This situation contrasts sharply with the case of the nonproblem children. With these children, 12 of 12 adults presented all eight of the available tasks. Apparently, the higher rate of problem behavior (by problem children) contingent on presentation of task commands was associated with adults' restricting the breadth of teaching. In contrast, the same adults typically exhibited maximum breadth of teaching with respect to the nonproblem children, who rarely displayed problem behavior contingent on presentation of task commands.

Table 3 also presents the median percentage of behavior problems following the presentation of tolerated versus untolerated tasks. When Adult 1 presented the three tolerated tasks, no behavior problems occurred. In contrast, when she presented the three untolerated tasks, the median level of problem behavior was 67%. This pattern was typical for the other adults for whom a comparison

could be made; that is, the level of problem behavior was almost always at or near 0% following presentation of tolerated tasks (i.e., the medians ranged from 0% to 20%) but was substantially higher following presentation of untolerated tasks (i.e., the medians ranged from 36.5% to 100%).

Finally, Table 3 shows the relationship between the number of trials in which particular tasks were presented and the likelihood that those tasks were followed by problem behavior. A trial was defined as the presentation of a specific task command plus the related instructional behaviors previously defined. Adult 1 presented a total of 89 trials, but only 15 trials involved untolerated tasks. Overall, adults presented significantly more tolerated than untolerated tasks to the problem children, $t(18) = 2.10, p < .05$. A different way of describing these findings is to say that, for Adult 1, only 16.9% of the trials involved untolerated tasks. Importantly, because there were three untolerated tasks and three tolerated tasks, one would expect that if the adult had been selecting tasks at random, then 50% of the trials should have involved untolerated tasks. Thus, the percentage of untolerated tasks presented was less than that expected by chance. This finding was typical for the other adult subjects as well. The comparison between actual versus expected percentages was not relevant for Adult 10 (who presented no tasks) and Adult 11 (for whom all eight tasks were untolerated). For the remaining 10 subjects, 8 showed a pattern in which the actual percentage of untolerated tasks presented was less than the percentage expected by chance.

DISCUSSION

Theoretical Implications

The present results constitute a test of one aspect of the operant theory of behavior problems, specifically, the notion that some instances of serious misbehavior are maintained by negative reinforcement produced by the termination of academic task demands (Carr, 1977; Carr & Durand, 1985b; Iwata, 1987). It is necessary to point out that in the absence of a direct experimental manipulation of contingencies (i.e., a functional analysis), one cannot completely rule out the possibility that at least some of the problem behaviors were maintained by attention (positive reinforcement) rather than escape (negative reinforcement). However, this possibility is made improbable by two sets of data. First, problem behavior occurred frequently in response to instructions and infrequently at other times (Table 2). This pattern has been interpreted repeatedly in the literature (e.g., Carr, Newsom, & Binkoff, 1980) as an indication of control by negative reinforcement (escape). Second, when the adult directed her attention away from the problem child in order to instruct the nonproblem child, the problem child responded with low levels of misbehavior. This pattern is the opposite of what one would expect from the empirical literature on attention-based problem behavior (Carr & Durand, 1985a). For these reasons, it is plausible to view the problem behaviors exhibited in the present study as maintained by negative reinforcement (escape).

Previous research has demonstrated a correlation between the overall level of task demands and the overall level of behavior problems (Carr & Durand, 1985a; Carr & Newsom, 1985; Carr, Newsom, & Binkoff, 1976, 1980; Plummer, Baer, & LeBlanc, 1977; Sailor, Guess, Rutherford, & Baer, 1968; Weeks & Gaylord-Ross, 1981). The operant theory of escape responding, however, requires more than a correlation. It predicts that there should be a direct contingency between the presentation of a putatively aversive stimulus (e.g., task commands) and consequent behavior problems. This aspect of the theory was confirmed by the data in Table 2 and Figure 1. These data demonstrated that when the adult presented either general instructions or specific task commands, the problem children exhibited misbehavior, but they rarely misbehaved when no demands were placed on them.

The operant theory also conceptualizes child misbehavior as an aversive stimulus (punisher) for any adult behavior that it follows. Therefore, in the present case, the theory predicts that the adult should teach problem children less often because those children punish adult teaching efforts. Again, this prediction was borne out by the data in Figure 1, which show that all 12 adults presented fewer task

commands to the problem children, presumably in response to the higher levels of punishment (misbehavior) they received from these children when teaching efforts were made. Interestingly, the data are also consistent with the basic research literature on matching behavior in choice situations. Specifically, this literature demonstrates that when individuals are confronted with a choice involving a highly punished response alternative (in the present case, teaching the problem child) versus a less punished response alternative (in the present case, teaching the nonproblem child), the individual chooses to spend more time responding on the less punished alternative (Deluty, 1982).

We have been arguing, on the basis of data in Figure 1, that the adult presented fewer demands to the problem child because teaching efforts were punished (through misbehavior). It is possible, however, that the direction of causality may be the opposite of what we have suggested. That is, it may be that a low level of teaching effort (few commands) evokes behavior problems. This interpretation, however, is made implausible by the data in Table 2. Table 2 clearly demonstrates that when the problem child was not presented with instructional stimuli, the incidence of behavior problems was low. Thus, the causal process seems to involve a situation in which punishment of teaching efforts results in low rates of task commands, a finding consistent with an escape conceptualization.

Finally, the data on *what* is taught (as opposed to *who* is taught) also support the operant theory. The theory predicts that a teacher will typically choose those tasks associated with high levels of punishment (misbehavior) less frequently than those associated with low levels of punishment. This prediction was directly confirmed by the data in Table 3, a finding, incidentally, that is also consistent with basic research on choice (Deluty, 1982).

Assessment Implications

Literature has recently emerged concerning the assessment of variables controlling severe behavior problems. One aspect of this literature concerns the use of indirect measures, such as interviews and questionnaires, to identify relevant controlling variables (Durand & Crimmins, 1988; Groden, 1989; O'Neill, Horner, Albin, Storey, & Sprague, 1989). Commonly, parents and teachers are asked to identify whether certain tasks reliably evoke behavior problems in order to determine whether escape may be a critical factor. Our data imply that there is an additional question that may be useful, namely, whether certain aspects of the curriculum have been discontinued and, if so, why? With current assessment devices, it is conceivable that a teacher could respond that most of the time it is possible to teach a child a variety of tasks without too many problems. Yet, as the data in Table 3 make clear, this positive outcome is achieved only by limiting the presentation of those tasks that cause problems. In short, escape factors may sometimes be more evident from information pertaining to which tasks have been discontinued or reduced in frequency, information that might not be apparent from either direct observation or queries designed to determine which tasks are presently in use. A related question that may be helpful is implied by the data in Figure 1, which show that teachers present more tasks to nonproblem children. Therefore, an important assessment question might be whether the teacher prefers to instruct some children more than others and, if so, why? Again, preference (or nonpreference) may imply escape as a factor.

The data of Table 3 suggest that children, rather than adults, may sometimes shape the academic curriculum. Therefore, assessments of the adequacy of and rationale for specific curricula should consider the possible influence of child effects based on behavior problems maintained by escape. Thus, it may be important to ask whether the presence of a large number of tasks involving puzzles and pegboards is an attempt to strengthen sensorimotor skills in a Piagetian paradigm (Stephens, 1977) or whether the presence of these largely nonfunctional tasks is the result of those tasks being easy for the student and thus correlated with a low rate of punishment (i.e., child misbehavior). Existing curricula may need to be altered if assessment suggests that curricular choices are more a function of child

effects (i.e., the teacher chooses items known to be correlated with few behavior problems) than educational utility and long-term benefits. Of course, children should be allowed to make choices whenever it is reasonable for them to do so (Dyer, Dunlap, & Winterling, 1989; Houghton, Bronicki, & Guess, 1987). However, the issue at hand concerns whether they should be allowed to make choices contingent on the emission of severe behavior problems and also whether they should be permitted to choose the same limited tasks for months at a time.

There is also the question of how to evaluate decreases in behavior problems observed to occur over time in educational settings. One possibility is that improvements are the direct result of specific constructive treatments. Another possibility, raised by the present study, is that improvements are the result of child-effect variables. That is, there is a danger that, over time, teachers may learn to withdraw certain tasks that evoke problem behavior. Therefore, it is possible that improvements in behavior are due more to child-induced curricular rearrangements than to adult-initiated treatments per se. It may not be in the best interests of the child for the teacher to withdraw certain aspects of the curriculum in order to minimize behavior problems. A better strategy would be to address the issue of escape factors directly while maintaining a meaningful and constructive curriculum.

The possibility of long-term trends was not addressed in the present study because the analysis was based on only five sessions per adult subject. A clinically meaningful trend analysis would have to be based on a much longer time span, preferably measured over months. However, the consistent effects observed over the short term in the present study seem to justify conducting a similar analysis over a longer period.

Finally, although some of the adults who carried out the instructional sessions had experience with children who had disabilities and problem behavior, none of the adults were state-certified teachers. Full generalizability of our results to certified teachers requires a follow-up study involving these individuals as the instructional agents. Nonetheless, our focus in the present study was more on teaching behavior than on teachers per se.

Intervention Implications

The major implication of our data concerns the issue of maintenance. Maintenance failures are often ascribed to inadequacies in intervention methods; therefore, the necessity for procedural modification of those methods is stressed (Sulzer-Azaroff & Mayer, 1977). Although this analysis may often be correct, our data suggest that procedural shortcomings may not be the only factor involved in maintenance failure. Specifically, it may be that the procedure itself is reasonable but that the treatment agent who implements the procedure is severely punished for doing so (i.e., procedural implementation is reliably followed by child misbehavior). In the present case, the instructional procedures used (e.g., discrete-trial methods) are commonly reported in the literature as being effective in teaching certain skills (Koegel et al., 1977; Lovaas, 1981). However, at least occasionally, the child effects that accrue to the use of these procedures may be highly aversive to the treatment agent, causing that individual to terminate implementation of the procedure. Thus, the behavior of the *treatment agent* fails to be maintained over time. Perhaps this is one reason why some investigators now favor the use of naturalistic teaching methods rather than discrete-trial approaches (Koegel, Koegel, Murphy, & Ryan, 1989). In short, occasions may arise in which otherwise effective educational procedures produce poor outcomes, not because the procedures themselves are inadequate, but rather because the procedures generate a high rate of punishment (via child effects) for the agent attempting to use them. When the intervention agent fails to maintain his or her treatment behavior, it is reasonable to expect that treatment effects too will not be maintained. The implication of this analysis is that when a program planner has a choice between two or more effective educational procedures, it may be worthwhile to consider choosing the one associated with the fewest adverse child effects for the treatment agent.

The results of the present study suggest that behavior problems cannot be fully understood solely by measuring the behavior of the individual who is exhibiting those problems. Instead, recognition must be given to the fact that individuals who engage in serious misbehavior affect others in systematic and reliable ways. The individual displaying the problem and others who are affected by the problem can best be viewed as participating in a social system in which reciprocal influence is the rule. Therefore, the detailed analysis of this reciprocity ought to be a major focus for investigators concerned with understanding and treating behavior problems.

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Received July 16, 1990
Initial editorial decision September 11, 1990
Revisions received November 17, 1990; December 31, 1990
Final acceptance March 10, 1991
Action Editor, David P. Wacker